MINNESOTA DEPARTMENT OF PUBLIC SAFETY

Emergency Communication Networks

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Office of Communications

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State Fire Marshal

September 20, 2010

VIA ELECTRONIC DELIVERY

Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Washington, DC 20554

Re: PS Docket No. 10-168
Public Safety and Homeland Security Bureau Seeks Comment on Increasing Public Safety Interoperability by Promoting Competition for Public Safety Communications Technologies

Dear Madam Secretary,

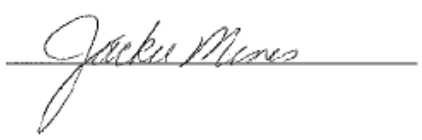
In accordance with the Commission's rules, the Minnesota Division of Emergency Communication Networks (DECN) submits this filing regarding the above-captioned proceeding.

For both narrowband and broadband networks, DECN believes that open standards-based technology provides the greatest competition benefit as well as the highest level of interoperability.

While DECN respects the Commission's opinion regarding Project-25 (P25), the Division believes, contrary to the Commission's opinion, that Project-25 (P25) systems provide interoperable communications and foster market competition.

DECN believes that a truly robust and interoperable public safety broadband data network may only be realized through the allocation of the 700-MHz D Block to public safety. This broadband network must utilize standards-based technologies. DECN believes that the Commission should continue explore alternative public/private partnerships that may work to the benefit of such a network.

Respectfully,



Jackie Mines, Director
Minnesota Emergency Communication Networks

Question 1: *What are the factors that affect the current state of competition in the provision of public safety communications equipment? Are there any additional barriers to additional manufacturers supplying network equipment to the public safety community for narrowband communications? For broadband communications?*

Answer:

While Project-25 (P25) is not the only narrowband communications technology available for public safety, it is, as the Commission remarks, the leading such standard in North America[1]. Competition in the provision of this equipment has historically been dominated by the incumbency of suppliers with proprietary solutions for specific markets, as the Commission has acknowledged[2] [3].

The Commission has noted that protracted standards development has led to market exploitation. This is generally true. Where delayed P25 standards release has limited the availability of technology solutions, suppliers have offered proprietary technologies. For example, many public safety organizations committed to wide-area narrowband trunking systems[4] before P25 standards-based solutions were available[5]. In these cases, organizations often turned to proprietary solutions. These solutions offer key market-distorting advantages to incumbents.

As P25 standards enter completion, vendors can produce standards-based interoperable narrowband communications equipment on a competitive basis.

Question 2: *How would additional competition in the provision of public safety communications equipment improve narrowband or broadband interoperability? Conversely, what impact does the current state of competition in the provision of public safety communications equipment and devices have on interoperability? Assuming additional competition would benefit public safety interoperability, what actions could the Commission take to improve competition in the provision of public safety communications equipment?*

Answer:

Competition, so long as it is standards-based, is not related to interoperability. Standards-based technologies, by their nature, are interoperable. This is regardless of respective market share or incumbency of provider. However, in order to promote interoperability, the Commission must, to the extent possible, encourage standards-based communications equipment.

For example, the state of Minnesota employs a P25-based radio system utilizing equipment from many different vendors. This radio equipment is fully interoperable regardless of original manufacturer.

Regarding the issue of competition, the Commission has compared public safety communications equipment to commercial mobile communications equipment. The Commission points to standards-based technical solutions the commercial mobile

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[1] *Letter from Julius Genachowski, Chairman, FCC, to Henry A Waxman, Chairman, Committee on Energy and Commerce, US House of Representatives* (July 20, 2010). See response to question 2: ". . . Project 25 (P25) [is] the leading standard for public safety narrowband communications . . ."

[2] *Letter from Julius Genachowski* (etc). See response to question 1.

[3] Kang, Cecelia; Washington Post: *FCC, Public Safety Groups at Over Control of Nationwide Wireless Network* (June 9, 2010). According to this article, Motorola's market share in this industry in the United States is 80%. Available online: http://www.washingtonpost.com/wp-dyn/content/article/2010/06/08/AR2010060805253.html

[4] The State of Ohio: *Multi-Agency Radio Communications Systems Task Force Report* (April 1, 2010). See appendix: "State Summaries".

[5] For example, *Project 25 Trunking Procedures* TIA-102 AABD-A, was published in December 2008, and *Project 25 Trunking Overview*, ANSI/TIA-102.AABA-A was published in June 2004. However, the Minnesota *Public Safety Statewide Radio Project* plan, which specifies an 800-MHz statewide trunked radio system, was endorsed by the Minnesota Commissioner of Public Safety in 2002. Please note that the state of Minnesota currently owns and operates a standards-based P25 radio system.

industry employs to address equipment interoperability[6]. If the Commission hopes for public safety customers to enjoy the same level of interoperability and economy of scale that the commercial mobile customers do, the Commission must encourage open standards for public safety communications.

However, the Division feels it is not fully appropriate to compare cost of equipment and networks for commercial mobile networks with public safety networks. Public safety networks are held to a different set of performance standards and functional characteristics. For example, cellular provides would hesitate to promise their customers 99.99999% service reliability, but this "5 9's" requirement is common in public safety systems. While 1% system downtime is, at worst, inconvenient for a wireless mobile subscriber, this same 1% could be nearly 4 days of continuous downtime for public safety agencies[7].

Question 3: *What are the limitations of Project 25 in promoting narrowband public safety communications interoperability? What actions, if any, should the Commission take to rectify these limitations?*

Answer:

P25 has two perennial complaints: the high cost of equipment (as the Commission acknowledges[8]), and protracted standards development. To remedy these issues, the Division encourages the Commission, to the extent possible, to support the accelerated development and adoption of P25 standards.

P25 voice systems promote inter-agency voice interoperability even in the most demanding scenarios. For example, during the I-35W bridge collapse in Minneapolis on August 1, 2007, Minnesota's ARMER radio system provided seamless radio communications interoperability for the many disparate first-response agencies arriving on-site[9]. As students of radio communications during first response are like to know, seamless communications interoperability during a disaster is contrary to the historical norm. These interoperable communications are possible with the implementation of Project 25 radio systems.

P25 standards are entering maturity. Almost all P25 standards are either in complete draft, published, under testing, or finalized[10]. Long awaited standards such as Two-slot TDMA Trunked Digital Phase 2[11] (providing 6.25 KHz spectral efficiency) and Inter-RF Subsystem Interface for Voice[12] and other P25 Services[13] are emerging in the public safety communications equipment marketplace.

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[6] *Letter from Julius Genachowski* (etc). See response to question 3: ". . . PSTN voice calling, text messaging, roaming, and IP connectivity".
[7] 1% of 365 days is 3.65 days.
[8] *Letter from Julius Genachowski* (etc). The Commission remarks that a land mobile radio for public safety may cost as much as $5000.
[9] *Performance Review: ARMER Radio System at I-35W bridge Collapse* (December 2008), pg. 4. Report prepared by Geocomm for the Minnesota State Radio Board. See ". . . the ARMER system provided consistent and reliable communications along multiple paths (talk-groups) throughout the incident . . . the ARMER system performed admirably throughout the response . . . it provided strong, high quality audio to thousands of users in thousands of radio transmissions, thereby knitting the entire [metropolitan] response community together into one functional unit."
[10] See *Project 25 Documents and Standards Reference Development Status.* Available online at: http://www.pscr.gov/outreach/p25dsr/menu_top/p25_documents_quick_status.php
[11] See *Project 25 Documents and Standards Reference.* Standards TIA-102.BBAA, TIA-102.BABA, TIA-102.BABA-1, TIA-102.BBAB, TIA-102.BBAC, and others. Available online at: http://www.pscr.gov/outreach/p25dsr/p25_interfaces_systems/two-slot_tdma_trunked_digital.php
[12] See Id. Standard BACA-A and others. Available online at: http://www.pscr.gov/outreach/p25dsr/p25_interfaces_systems/inter-rf_subsystem_interface_voice_services.php
[13] See Id. Standard BACA-A and others. Available online at: http://www.pscr.gov/outreach/p25dsr/p25_interfaces_systems/inter-rf_subsystem_interface_additional_services.php

High equipment costs do impact interoperability. If a public safety agency cannot afford P25 radio equipment, it follows that it will not enjoy P25-provided interoperability. However, P25 customers are presently enjoying sharply reduced P25 equipment costs when compared to the past. While the Commission states that a P25 radio for public safety can cost $5000[14], publically-available data shows that narrowband P25 narrowband trunking subscriber equipment is now available on various contracts for under $1200[15].

As noted in Questions 1 and 2, open standards such as P25 encourage competition and eliminate competition's impact on interoperability.

Question 4: *Could open standards for public safety equipment increase competition? What actions could the Competition take to facilitate openness?*

Answer:

The Division feels that open standards do increase competition. Major public safety entities endorse technologies such as P25[16] and LTE[17] principally because they are standards based, and as such, promote interoperability. As discussed earlier, technologies based on standards are beneficial to competition by their nature.

In order to facilitate further competition, the Commission must encourage the adoption of standards-based technologies. For example, see P25 for narrowband communications and LTE for broadband communications.

Question 5: *As the Commission considers requirements for the 700 MHz broadband public safety network, are there any requirements on public safety equipment or network operators that would increase competition in the provision of public safety equipment? How can the Commission's work on requirements for the 700 MHz broadband public safety network be leveraged to promote interoperability between narrowband and broadband networks?*

Answer:

In promoting interoperability and market competition among public safety broadband data network equipment, the Commission should:

1. Require standards-based technology for a public safety broadband data networks, and:
2. Support allocation of the D Block for Public Safety users, and:
3. Continue to explore alternative public/private partnerships for use of D Block spectrum.

With regards to interoperability, standards-based technologies provide the only solution for a nationwide public safety broadband data network. Technologies not based on standards will not be interoperable with any other technologies. To that extent, the Commission must require a single standards-based technology for all public safety wireless broadband licensees nationwide.

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[14] See *Letter from Julius Genachowski* (etc). The Commission remarks that a land mobile radio for public safety may cost as much as $5000.

[15] See *State of Minnesota Contract Release R-651(5)*. Examples include Kenwood TK-5310 for $1160.00 and Motorola XTS 1500 for $1,185.00. Please note that these prices do not always include accessories, which may add up to $200 in costs. Available online at: http://www.srb.state.mn.us/pdf/State%20Contract_Equipment_2010.pdf

[16] Telecommunication Industry Association (TIA): *Project-25*. This article explains that APCO is one of the principle entities responsible for the development of P25. Available online: http://www.tiaonline.org/standards/technology/project_25/

[17] *APCO and NENA Endorse LTE as Technology Standard for the Development of Nationwide Broadband Network* (July 9, 2009). Available online: http://www.apco911.org/new/news/nena_endorse_lte.php

Note that all major public safety organizations have formally endorsed their support of a particular standards-based technology, LTE, as the technology of choice for providing public safety officers with a nationwide, interoperable wireless broadband communications network. The Commission has recognized this endorsement, as well as the endorsement of countless other public safety entities, and has voiced its tentative support[18].

Additionally, the Commission has specified the LTE air interface standard for all 21 waiver recipients and beneficiaries of long term de facto transfer spectrum lease agreements currently developing data networks in the 700 MHz public safety broadband spectrum[19] [20]. While the Commission has not, as of yet, mandated LTE for future broadband data deployments, the Commission should consider choosing a single air interface for present and future public safety wireless broadband networks.

Technology based on standards shared with commercial entities[21] will allow public safety users to reap the benefits of market competition associated with commercial products. As the Commission has observed, legacy public safety communications solutions have been characterized by a small market niche and proprietary interim solutions that significantly increase their costs[22]. In the 700 MHz band, the majority of US cellular providers[23] plan to offer data service nationwide utilizing the same interoperable technology as public safety broadband waiver recipients[24]. Unlike technologies such as Project 25 marketed exclusively or almost exclusively for public safety users, this interoperable and commercially-sold network equipment provides public safety entities with the benefit of an established market and a large economy of scale.

With regards to D Block allocation, the Commission should support allocation of the D Block for public safety to provide long-term interoperability for public safety broadband data.

Technology convergence highlights the importance of public safety users being provided contiguous spectrum in order to build robust interoperable networks. Looking forward, public safety communications networks will not be built for distinct features such as voice or data, but rather will incorporate many simultaneous multimedia communications over the same wireless pathways. This view of convergence is consistent with the views of other entities who do not directly advocate for public safety, such as the NTIA[25]. With this view, the 10 MHz allocated for public safety broadband does not provide sufficient bandwidth for multimedia applications. To support this assertion, numerous studies are available that provide greater technical detail than fits within the scope of this letter[26]. The D block would provide public safety users with a large block of contiguous spectrum to build an interoperable data network for multimedia communications.

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[18] *National Broadband Plan*, ch. 16, p. 316: "The emerging consensus of the public safety community and carriers is that 700 MHz networks will use the Long Term Evolution (LTE) family of standards. The Commission should consider designating this standard."

[19] *FCC Grants Conditional Approval of 21 Petitions by Cities, Counties, and States to Build Interoperable Broadband Networks for America's First Responders* (May 12, 2010). Available online: http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-298124A1.pdf

[20] *FCC Public Notice DA 10-1678*. Note: Alabama has not met the Commission's waiver conditions and does not have the authority to proceed under its waiver order.

[21] Examples include LTE and WiMAX.

[22] *Letter from Julius Genachowski (*etc). See response to question 2, and even more specifically, see comparisons to cellular handsets and TETRA handsets.

[23] "Majority" is defined by "group of providers servicing more than half of market share". See Comscore: *US Mobile Subscriber Market Share* (March 2010). Verizon, which has 31.1% US mobile subscriber market share, and AT&T, which has 25.2% market share, together make up the majority of US commercial mobile service.

[24] Business Week: *T-Mobile Looks to Lag in Offering 4G Service* (August 10, 2010). According to Business Week's report, Verizon and AT&T, who, per Comscore's report, hold the majority of US mobile market share, have committed to or already deployed wireless LTE networks. Available online: http://www.businessweek.com/technology/content/aug2010/tc2010089_636192.htm

[25] *NTIA Executive Branch Views On Public Safety, Homeland Security and Cyber security Elements of a National Broadband Plan* (December 2009), Page 11

[26] For example: Seybold, Andrew: *Re: 700 MHz Interoperable Broadband Public Safety Network* (September 10, 2010). Ex parte notice; FCC Dockets 06-150, 06-229, 09-47, 09-51, 09-137, and RM 11592.

The Commission has long-advocated a public/private partnership for the D Block. The Commission is applauded for exploring a partnership, as a partnership can provide funding and network equipment for public safety users while encouraging free market competition and use of a precious resource (spectrum) by the general public. However, the Commission is advised to explore new alternatives.

The Commission's originally proposed partnership would have auctioned the D Block to a commercial entity, who would provide service to public safety users. Nonetheless, the D Block failed to auction under these terms during the 2008 spectrum auction. This demonstrates the relative lack of commercial interest in the existing proposal for such a partnership[27]. The Commission specifies the interoperable LTE air interface for this proposed partnership, but it is unlikely that any major wireless carrier with the capital to purchase the D Block would be interested in deploying an LTE network with it[28].

The Commission is encouraged to continue exploring alternative public/private partnerships. For example, one proposed bill[29] would authorize public safety entities to lease spectrum resources to non-government entities on a secondary basis. In this case, the general public would have use of the spectrum, and public safety entities would gather funding to build an interoperable broadband network in the contiguous D Block and adjoining public safety broadband spectrum. Per various lease provisions, network equipment may be built in some regions by local government, and in other regions by commercial operators; however, so long as the network air interface is standardized, there is one interoperable network. This type of partnership is supported by most major public safety organizations[30].

Alternative partnerships, such as the one described above, meet the goals of a public/private partnership by providing funding or network equipment for public safety entities, providing use of the spectrum to the general public, and promoting free market competition in a network equipment category utilized by public safety.

The Commission is advised to consider that any public/private partnership should include pre-emptive network access and network control for public safety users. Observe an October 11, 2006 plane crash in New York City, where first responders with priority access to a commercial cellular network were unable to communicate due to congestion. These responders were denied access because they were provided first-in-queue, rather than preemptive priority access[31]. Because the responders were using a commercial network, New York City officials could not adjust network parameters to rectify the issue[32]. While first responders in this case had priority access, their requests for service were placed at the head of a queue that did not move. Network congestion had rendered their priority useless.

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[27] *US Spectrum Auction 73*. Summary available online: http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=73

[28] Business Week: *T-Mobile Looks to Lag in Offering 4G Service* (August 10, 2010). Verizon and AT&T have sufficient spectrum to deploy nationwide LTE networks. T-Mobile has committed to HSPA+, And Sprint has committed to WiMAX. Per Comscore's report, no other cellular carrier holds more than 5% of the wireless market, and as such, other carriers would be unlikely to have the capital necessary to purchase spectrum in an auction to build an LTE network.

[29] "Public Safety Spectrum and Wireless Innovation Act". S.3756, 111th congress, 2nd session. Available online: http://www.npstc.org/documents/S.%203756-100805.pdf

[30] Specifically, APCO, NENA, and PSA have endorsed Rockefeller bill S.3756. See respective public statements online at: http://www.apco911.org/new/government/, http://www.nena.org/stories/government-affairs/nena-applauds-rockefeller-legislation, and http://www.psafirst.org/uploads/documents/Position_Statement_on_S_3756.pdf.

[31] City of New York, Office of Information Technology and Communications: *700 MHz Broadband Public Safety Applications and Spectrum Requirements* (February 2010), pp. 6-7.

[32] See Id.

In summary:

The Division recommends that the Commission, in order to facilitate interoperability and market competition:

1. Promotes and/or requires standards-based technologies for public safety to facilitate interoperability and market competition, and:
2. Promotes, to the fullest extent possible, accelerated development and adoption of standards-based communications technologies such as Project-25, and:
3. Supports the allocation of the D Block for Public Safety in order to facilitate a robust and truly interoperable broadband data network, and:
4. Explores alternative public/private partnerships in the D Block spectrum.